

REMARKS

Claims 1, 3-14, 16-19, 21-26, 28-37, and 39-46 remaining pending in the application. Claim 47 is withdrawn. No claims presently stand allowed.

Summary of the Office Action:

Claims 1, 3, 5-9, 11-14, 16-19, 21-29, 31-35, 37, 39, 40, and 42-46 are rejected under 35 U.S.C. § 103 as obvious over U.S. Patent No. 6,148,095 (“Prause”) in view of U.S. Patent No. 5,771,895 (“Slager”); Claims 4 and 41 are rejected under § 103 as obvious over Prause, Slager and further in view of U.S. Patent No. 6,200,268 (“Vince”); and claims 10, 30, and 36 are rejected under § 103 as obvious over Prause, Slager and further in view of U.S. Patent No. 5,284,148 (“Dias”).

Discussion of the Rejections under 35 U.S.C. § 103

Applicants traverse the rejection of independent claims 1, 11, 19, 31, 39 and their corresponding dependent claims. Claim 1 recites recites a system with a “data gathering device” that is adapted to “acquire said heartbeat data; identify a cyclical portion of said heartbeat data; and acquire said blood-vessel data during an interval substantially corresponding to said cyclical portion of said heartbeat data...during the interval in response to a probe-trigger marking a beginning of the cyclical portion.” As described in Applicants’ specification, the claimed system allows analysis (e.g. imaging) of the blood vessel as if it were standing still by collecting data during a cyclical portion of the heartbeat cycle when the vessel is in the same relative position as it expands and/or contracts. Moreover, the claimed system allows selective acquisition of the vessel data of interest on the fly thereby avoiding time consuming post processing associated with prior art systems.

The Prause patent, upon which the rejection of the claims relies, discloses a system wherein data is continuously received and stored by the system. Afterward, during a data processing stage that is independent of the data acquisition stage, a processor selects certain of the previously recorded VHS image frames based upon a heart cycle signal. Thus, Prause is able to select frames of interest, but at considerably greater computation and memory resource expense than the claimed invention wherein a “trigger” selectively enables image data acquisition of “blood-vessel data during an interval substantially corresponding to said cyclical portion of said heartbeat data.” Indeed, the type of system disclosed in Prause, and its disadvantages, are described in the Background section of Applicants’ specification. *See* specification at ¶ [0008] to [0009].

The Examiner appears to agree that Prause fails to disclose “triggered image acquisition.” *See* Office Action at ¶ 5. However, the Examiner relies upon Slager for such teaching. *See id. citing* Slager at abstract, col. 5, line 7-28. Applicants respectfully disagree with the conclusion that the combination of Slager and Prause render claim 1 obvious. Slager, like Prause, is devoid of any disclosure or teaching of “acquire said blood-vessel data during an interval substantially corresponding to said cyclical portion of said heartbeat data...during the interval in response to a probe-trigger marking a beginning of the cyclical portion.”

Slager is primarily directed to post acquisition reconstruction of a 3-D path of a catheter axis. *See e.g.*, Slager Abstract, col. 4, lines 60-col. 5 line 25; col. 6, lines 14-35; col. 8, line 39-47. IVUS images are then wrapped around this axis to reconstruct a 3-D image of the vasculature. The portion of Slager relied on by the Examiner provides, in part, “In one preferred embodiment, the X-ray image acquisition of the *centerline* should be triggered by respiration and/or electrocardiogram. ... In another preferred embodiment, the *pull-back* may be applied step-wise each time after the ultrasound image has been acquired in an ECG and respiration triggered mode.” With respect to the first statement, Applicants are not claiming X-ray acquisition of a catheter center line. Rather, Applicants are claiming triggered acquisition of “blood-vessel data.”

With respect to the second statement quoted above, Slager does not disclose selective acquisition of “blood-vessel data” during a cyclical portion of “heartbeat data.” Rather, Slager describes a method and system where catheter pullback is triggered by ECG. *See id.*, at Col. 6, lines 18-22: “We apply, as a first step, the same IVUS technology during an automated pull-back of a sheathed IVUS catheter at a speed of, for example, 1 mm/second or, in case of triggering by the ECG and respiration, in, for example, 1 mm steps.” Like Prause, Slager is directed to a system where all image data is collected and then subjected to a post processing step. In this regard, Slager discloses “The IVUS images are recorded during automated pull-back on a PAL standard S-VHS video tape, resulting in *25 images/second* ... Following acquisition, the S-VHS images are semi-automatically processed.” *Id.*, col. 12, lines 8-29.

For the reasons stated above, neither Prause nor Slager disclose, teach or suggest “triggered acquisition” of data from a data gathering probe during a cyclical portion of heart

beat data as claimed. For at least this reason, claim 1 and its dependent claims are patentable over Prause and Slager even when the teachings of those references are combined.

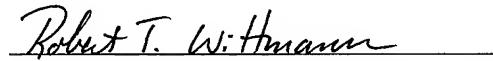
Remaining independent claims 11, 19, 31 and 39 each include the above discussed “trigger” mechanism associated with data gather in the claimed systems and methods. Thus, the remaining independent claims and their dependent claims are patentable for the same reasons as claim 1.

The Office Action also rejects claims 4 and 41 as obvious over Prause in view of Slager and further in view of Vince and dependent claims 10, 30, and 36 as obvious over Prause in view of Slager and further in view of Dias. Each of these rejections is predicated on Prause and Slager teaching each of the limitations set forth in the corresponding independent claim. As set forth above, the independent claims are patentable over the combination of Prause and Slager. For the same reasons, claims 4, 10, 30, 36 and 41 are patentable over the cited references.

Conclusion

Applicants respectfully submit that the patent application is in condition for allowance. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,



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Date: October 14, 2008